STANDARD ZONES and "STANDARD ZONES"

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The use of standard zones of calcareous nannofossils has become "second nature to us now" when we subdivide Cretaceous or Cenozoic sediments. The introduction of letters and numbers instead of fossil names obviously has lifted our efforts up to a level where geophysicists, geochemists and geomagnetists not only recognize our input but actually accept it, crave for it, need it and work with it. It is easier to say or write: the base of NP 15 falls within Chron C-20, than: the base of the Chiphragmalithus alatus Zone, which for some authors is the Nannotetrina alata Zone or the Nannotetrina fulgens Zone, falls within Chron C-20. Moreover, the numbers take less room in illustrations, so more information can be correlated in one figure. So, in a general way, all is well and we should be happy. The problem starts when we use a "standard zone" instead of THE standard zone by changing one or both of its limits by substituting one or both defining species. To use NP 15 again, I can use the first occurrence (FO) of the genus Nannotetrina instead of the FO of N. alata (or N. fulgens) to define the base of the zone and the FO of Reticulofenestra umbilica instead of the last occurrence (LO) of Rhabdosphaera gladius for the definition of the top. These changes are necessary in sections, where the preservation of the nannofossils is poor. They probably are reasonable changes that do not basically alter the content of NP 15 much. But I am not using the real STANDARD ZONE NP 15. At the "Round table on calcareous nannoplankton" during the 1st International Conference on Paleoceanography, held in Zürich in 1983, I suggested to use small stars, points, lines or other signs behind, above and/or below the zonal number to indicate in a figure, which definition had been changed. The above "NP 15" with changed base and top could then be expressed:

NP 15^{*}_{*} or NP 15 -+ (- for lower boundary changed, + upper boundary changed)
NP $15^{\cdot}_{\cdot}$ or NP $15^{\cdot}_{\cdot}$ etc. Personally I prefer NP 15^{*}_{*}.

Such a combination can easily be used in texts and figures, does not take much room, but would convey the fact that we are using a different definition from the original one. We can then explain in the text or show in another figure exactly which definition we used. Our communication with

geophysicists will continue in the by now well established manner in providing them with letters and numbers, but we could keep honest about what we are actually doing. Percival (1984, DSDP Leg 73) has recently made a start in this direction stating: "At times the marker species used by Martini (1971) to define a particular zone are absent. Under these circumstances the author used secondary species to mark a zone, although the range of a secondary species may not be exactly the same as that of the primary species. Zones defined by secondary species are indicated by an asterisk." He used these in the text, but not in the tables.

A discussion of these suggestions is welcome, also from foram-specialists who face the same problems.